Fairchild Probe Parts

INSTRUCTION SHEET

Type 4200B Series & the Type 4309B Attenuator Probes

1. TECHNICAL SUMMARY

The following type probes are passive attenuator types used with a vertical amplifier plug-in to give a high impedance input for oscilloscopes having a 1 megohm input impedance shunted by 20-55 pf.

PERFORMANCE SPECIFICATIONS

Probe Type	Input Impedance	Input Capacity	Division Ratio (Volts/Div Factor)	Cable Length
4289B	1 meg	55-80 pf	1:1	4 ft.
4289B, MOD 101	1 meg	75-100 pf	1:1	8 ft.
4289B, MOD 102	1 meg	65-100 pf	1:1	6 ft.
4290B	10 meg	6.5-12 pf	10:1	4 ft.
4292B	10 meg	1.8-3 pf	100:1	4 ft.
4298B	10 meg	8-15 pf	10:1	8 ft.
4299B	10 meg	7-13 pf	10:1	6 ft.
4309B	10 meg	9-16 pf	10:1	9 ft.

2. USING THE PROBE

An attenuator probe lessens both the capacitive and resistive loading caused by the oscilloscope to a minimum value. Simultaneously, while isolating the oscilloscope from the signal source, it reduces the effective sensitivity of the instrument. In other words, the displayed waveform will be reduced in amplitude by the attenuation factor of the probe. The attenuation introduced by the probe permits measurement of signal voltages in excess of those which may be accommodated by the instrument.

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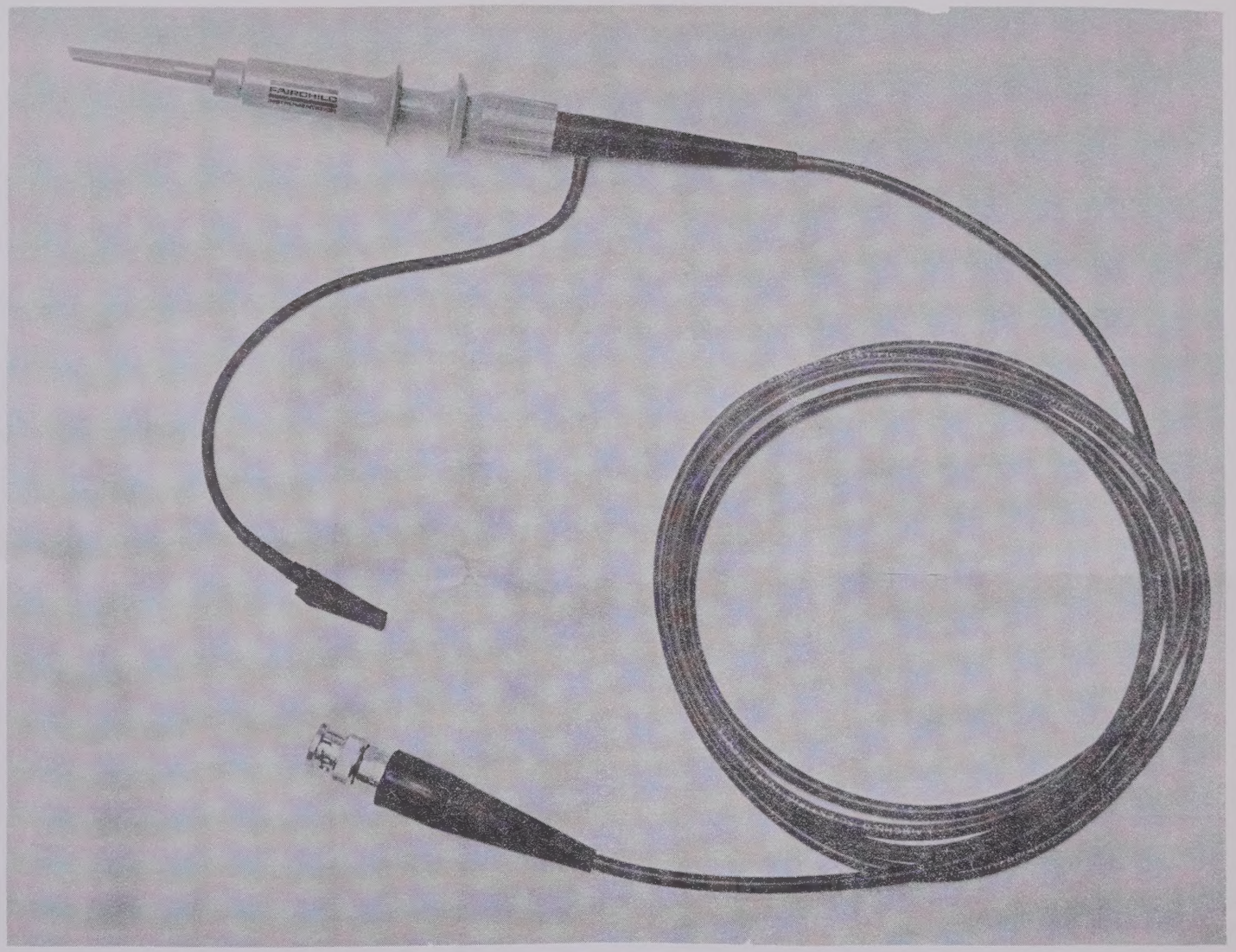


FIGURE 1. TYPE 4200B SERIES & TYPE 4309B ATTENUATOR PROBE

2. USING THE PROBE (concluded)

When using a probe to sample signals from a tuned, matched, or otherwise critical circuit, capacitive loading may cause erroneous readings. In these cases it may be necessary to add capacity and resistance to the circuit under observation. These values should precisely equal that of the probe impedance after the probe is removed from the circuit. This substitution will equalize loading and restore the operating characteristics of the circuit under observation to the same conditions when probe measurements were made.

When using the attenuator probe to make amplitude measurements, multiply the observed amplitude of the display by the attenuation factor marked on the probe.

Refer to paragraph 1 for the attenuation factor of the probes. The maximum voltage that may be applied to the probe is 600 volts peak-to-peak. Voltages in excess of this value (either dc volts or peak ac volts) may cause damage to components inside of the probe housing.

IMPORTANT: Before using the probe, always check its adjustment.

An adjustable capacitor (a mechanical adjusting sleeve in the probe body) compensates for variations in input capacitances from one unit to another. To insure accuracy in pulse and transient measurements, check the probe adjustment frequently.

To preserve the waveform of the signal being displayed, clip the probe ground lead to the chassis of the equipment being tested. Select a short, clean ground point near the probe input connection.

These probes may be connected directly to Input BNC connectors on the oscilloscope. The Type 2592-B Shielded Terminal Adapter (scope binding post to BNC connector) is required when the probe is connected to binding posts on the oscilloscope.

3. PROBE CAPACITY ADJUSTMENT

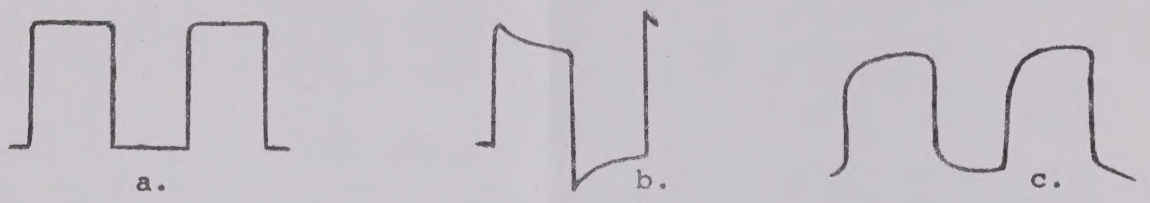
The adjustable mechanical capacitor in the sleeve assembly of the probe body must be adjusted for variations in input capacity for the particular oscilloscope with which the probe is to be used. To adjust the probe, proceed as follows:

a. Connect the probe to the input of the oscilloscope.

b. Set the oscilloscope attenuator for zero attenuation (maximum sensitivity).

c. Apply a 10 kHz square wave signal to the probe.

d. Adjust capacitor in probe by rotating the inner probe sleeve assembly either in or out until the best possible square wave response is obtained as shown in Figure 2a. Once the correct probe adjustment is obtained, the adjusting sleeve may be locked in place by turning the outer cap housing (see Figure 3) up against the sleeve.



a. Proper adjustment b, c Improper adjustments

FIGURE 2. WAVEFORMS ENCOUNTERED WHEN ADJUSTING ATTENUATOR

NOTE: When using the Fairchild Type 700 or 766 series Oscilloscopes, the output from the front panel CAL pin jack may be applied to the probe for adjusting it. Refer to the appropriate Instruction Manuals for details.

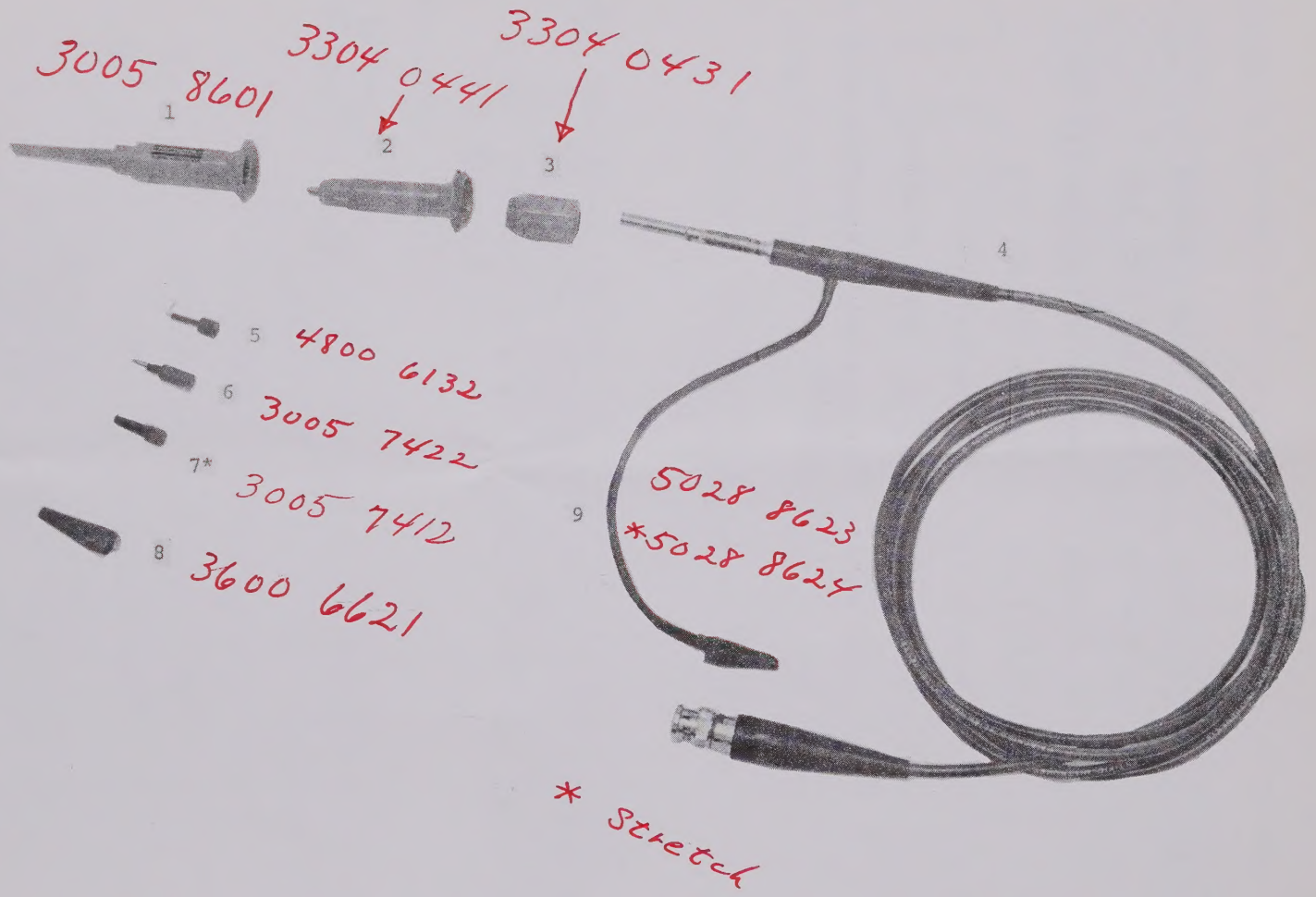
4. PARTS LIST

Reference No. (Figure 6)	Part Number	Description
1	3005 8601	Pincer Tip & Coupling Assembly
2	3304 0441	Outer Main Housing
3	3304 0431	Locking Sleeve
4	----	Cable Assembly
	5028 9401	Type 4289B
	5028 9402	Type 4289B, MOD 101
	5028 9403	Type 4289B, MOD 102
	5028 9404	Type 4290B
	5028 9405	Type 4298B
	5028 9406	Type 4299B
	5028 9407	Type 4292B
	5028 9408	Type 4309B

4. PARTS LIST (concluded)

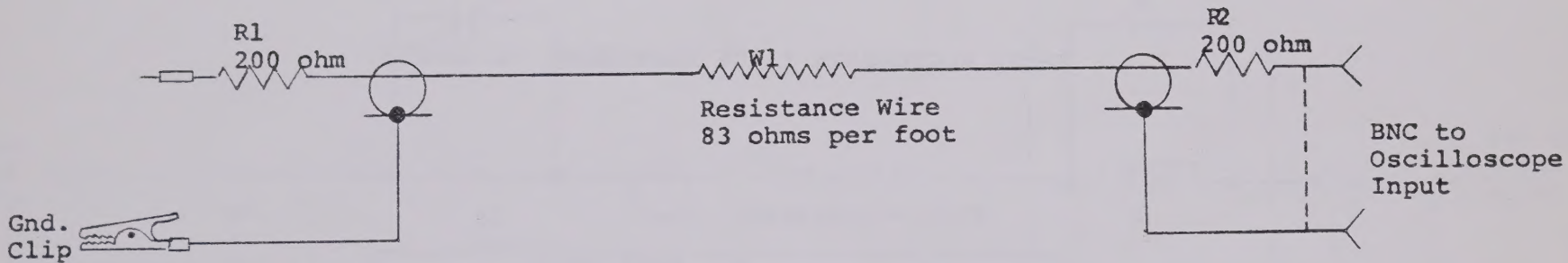
Reference No. (Figure 6)	Part Number	Description
5	4800 6132	Insulated Hook Tip
6	3005 7422	Insulated Long Needle Tip
*7	3005 7412	Spring Contact Tip
8	3600 6621	Alligator Clip
9	5028 8623	Ground Cable Assembly
	5028 8624*	Ground Cable Assembly with stretch cable

*Sales Option



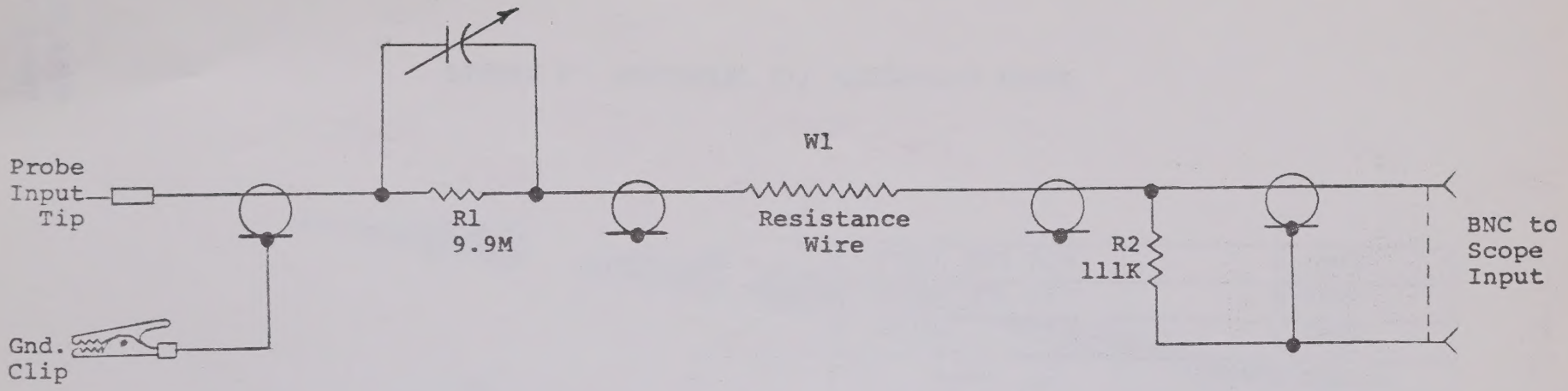
*Sales Option

FIGURE 3. TYPE 4200B SERIES & TYPE 4309 ATTENUATOR PROBE



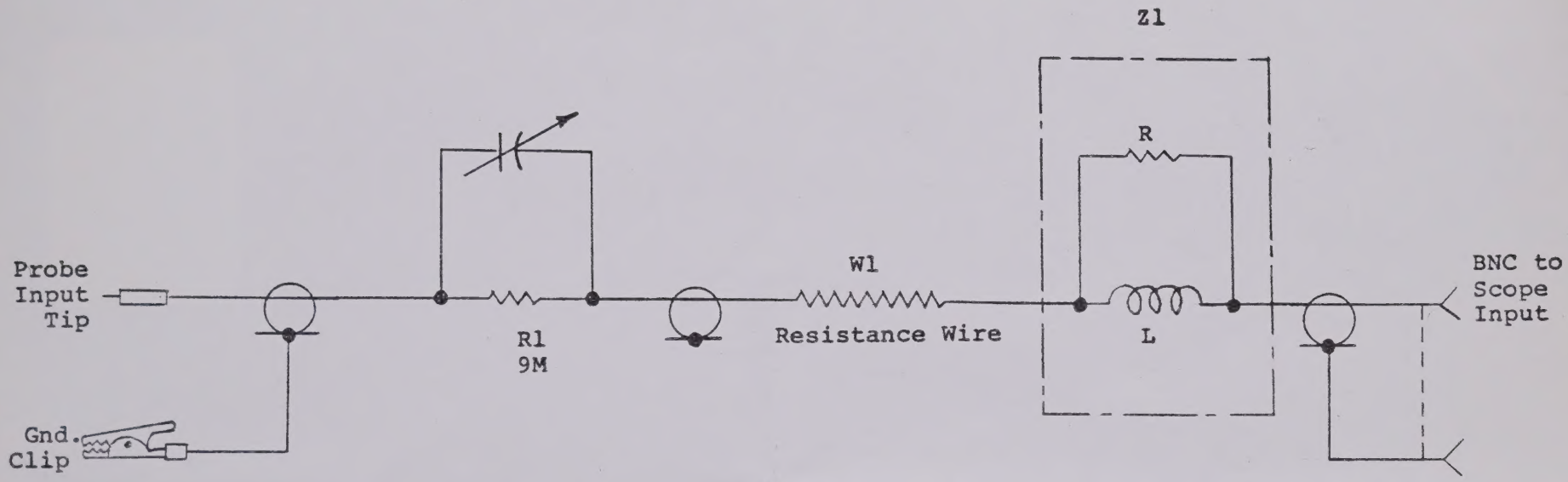
TYPE	OVERALL LENGTH
4289B	4 feet
4289B MOD 101	8 feet
4289B MOD 102	6 feet

FIGURE 4. SCHEMATIC 1:1 ATTENUATOR PROBE



TYPE	W1	OVERALL LENGTH
4292B	128 ohms per foot	4 feet

FIGURE 5. SCHEMATIC 100:1 ATTENUATOR PROBE



TYPE	W1	Z1 NETWORK	OVERALL LENGTH
4290B	173 ohms per foot	L - 32 turns #32 wire R - 20K, 1/2W	4 feet
4298B	83 ohms per foot	L - 22 turns #32 wire R - 620 ohms 1/2W	8 feet
4299B	106 ohms per foot	L - 26 turns #32 wire R - 750 ohms 1/2W	6 feet
4309B	83 ohms per foot	L - 30 turns #32 wire R - 510 ohms 1/2W	9 feet

FIGURE 6. SCHEMATIC 10:1 ATTENUATOR PROBE

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